Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 6.] NEW-YORK, JUNE 21, 1851. [NUMBER 40.

THE
Scientific American,
CIRCULATION 16,000.
PUBLISHED WEEKLY
At 128 Fulton, street, N. Y., (Sun Building,) and 13 Court street, Boston, Mass.
BY MUNN & COMPANY,
The Principal Office being at New York.
A. T. Hotchkiss, Boston.
Dexter & Bro., New York City.
Weld & Co., New Orleans.
Stokes & Bro., Philadelphia.
R. E. Edwards & Co., Cincinnati, O.
Jno. Thomson, "
Edwards & Ringgold, Louisville, Ky.
Cooke & LeCount, San Francisco, Cal.
Courtenay & Wienges, Charleston, S.
John Carruthers, Savannah. Ga.
Barlow, Payne & Parken, London.
M. M. Gardissal & Co. Paris.
Responsible Agents may also be found in all the principal cities and towns in the United States.

TERMS---$2 a-year---$1 in advance and the remainder in 6 months.

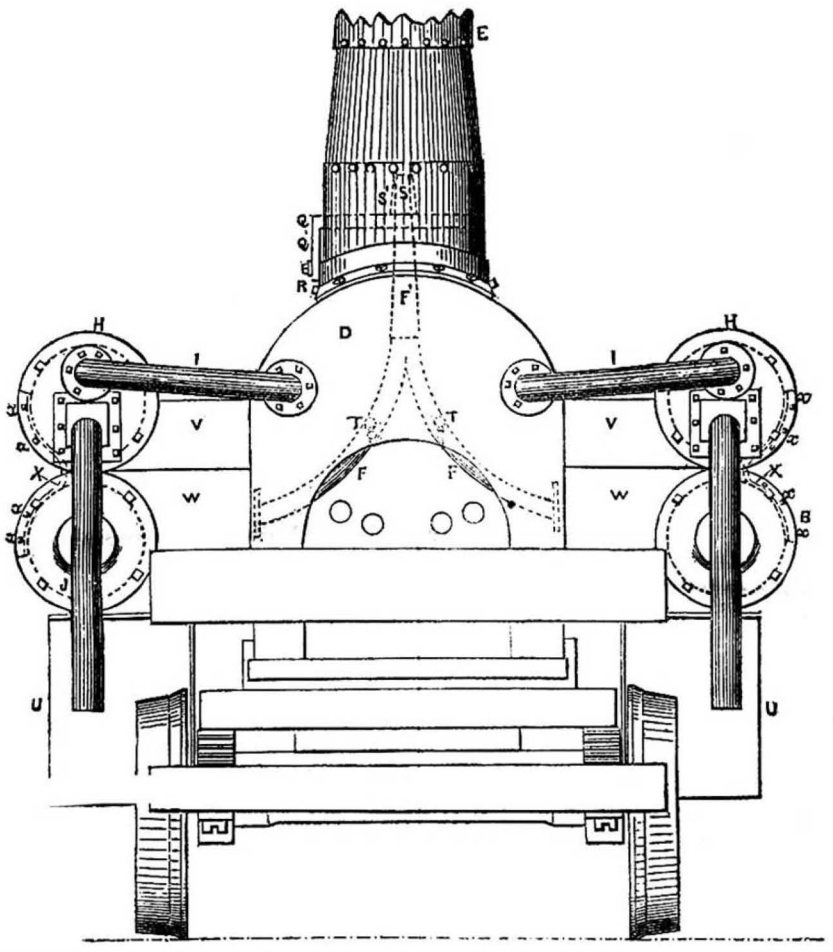
Rail-Road News.

Old Canals of Egypt.

At a recent meeting, May 20th, of the institution of civil engineers, Eng., a paper was read on the Isthmus of Suez and the ancient canals of Egypt, by Joseph Glynn, C. E. It was a very interesting paper. About 600 years before the Christian Era, Darius Hystapis, made a canal from the Nile to the Red Sea. It was in some places 150 feet wide and 30 feet deep. It passed through the valley to the Bitter Lakes, and was navigable for vessels of considerable size when the Nile was high. It also served for the supply of cities with water. The ancients assumed that there was a difference of level between the Red Sea and the Mediterranean, and precautions were taken to prevent the salt water of the Red Sea from mixing with the Nile. This canal fell to decay, but was restored about 644 A. D., by the Turkish Caliph Omar, who introduced many improvements and brought the canal to join the Nile near to Cairo. The general decay of Egypt brought about a decay of this canal again, and it became choked up 120 years afterwards, and for a thousand years it remained so, and was almost forgotten until Napoleon, that wonderful man, went to Egypt. He directed the eminent engineer Le Pere to survey it and report. The length was about 93 miles, through a low barren sandy plain and traversing many lagoons and lakes offering but few difficulties to engineering. Le Pere reported that the rise of high water in the Red Sea was 6 feet, in the Mediterranean 1 foot, and the surface of the former was stated to be very high at high water above low water in the latter. Mr. Robert Stephenson was present at the meeting, and as he had but recently returned from Egypt, he stated that the low water in the Red Sea and the Mediterranean were identical, and Le Pere made a great mistake, which he attributed to a hasty survey made in the time of war. The possibility of restoring this ancient canal was discussed. There is a ridge at the present moment at the end of the Red Sea, towards the Bitter Lakes, consisting of fossils identical with those of the London Basin, caused by a geological upheaval which had changed the features of the district. It has been considered that the Bitter Lakes were once the head waters of the Red Sea, and the ruins of cities and towns around, give evidence of the region being at one time very fertile—it was the land of Goshen, watered with a fresh stream from the canal of Sesostris, and from it Lake Temsah was supplied with pure water.

The Viceroy of Egypt has sanctioned the project of a railroad from Alexandria by way of Cairo, to the Isthmus of Suez, and the work will be commenced without delay.

WADE'S PATENT SPARK ARRESTER.---Fig. 1.



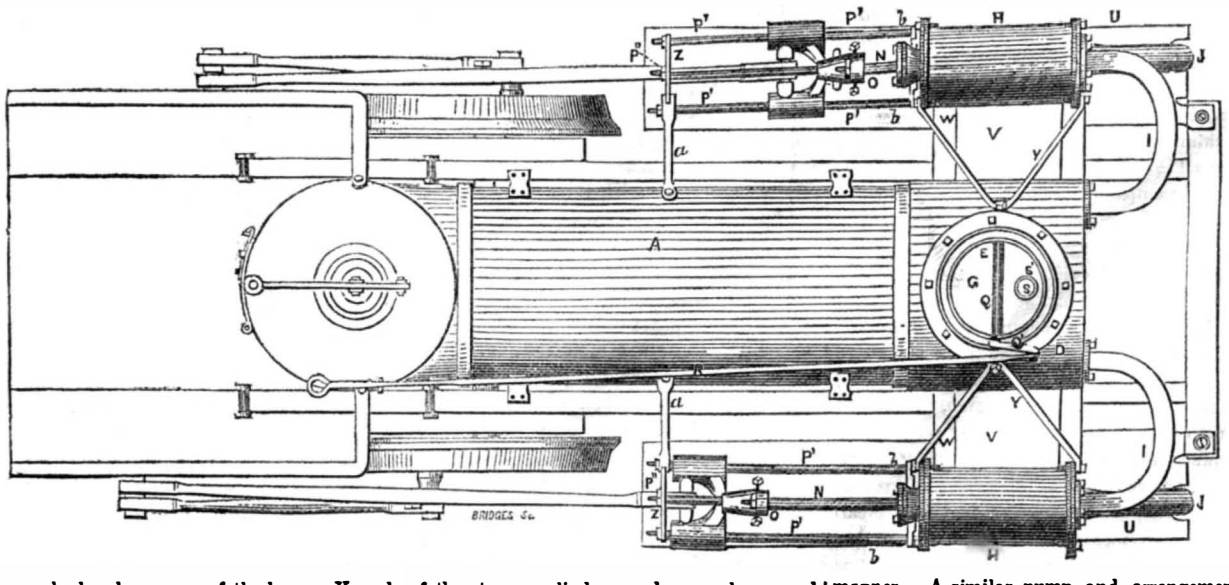
On the 24th of April, 1847, Mr. Robert M. Wade, of Wadesville, Clark County, Va., obtained a patent for improvements in machinery for conveying the sparks and smoke from the smoke stacks of the boilers of engines, and for extinguishing the sparks, which has, as it were, been hid in obscurity, but which, owing to so much attention having been given to the subject lately, the public should be better acquainted with. Fig. 1 is an end elevation of a locomotive, and fig. 2 is a plan view, showing the apparatus combined for drawing the smoke and sparks from the smoke box, and discharging them beneath the engine and pumps. Fig. 3 is an elevation of the com bined escape steam pipes and cocks. Figure 4 is a section of the pump, showing the valves and pistons. The two latter figures are on the next page. The same letters of reference indicate like parts on all the figures.

A is a common locomotive engine; B is the steam cylinder; D is the smoke box; E is the smoke stack; F are the pipes for conveying the escape steam into the smoke stack, the two upper ends being united into one pipe in the smoke stack, and containing two stop-cocks, T. G is a valve for closing the smoke stack attached to a horizontal axle, Q, having a crank, Q', operated by a rod, R, and having an opening in the same surrounded by a short pipe, S', which is open at both ends, and which closes over the connected ends of the steam pipes, F, allowing the escape steam to pass through the said valve into the smoke pipe, E, when said valve is closed. H is a pump combined with the steam cylinder for drawing the sparks and smoke from the smoke box and discharging them wherever required.

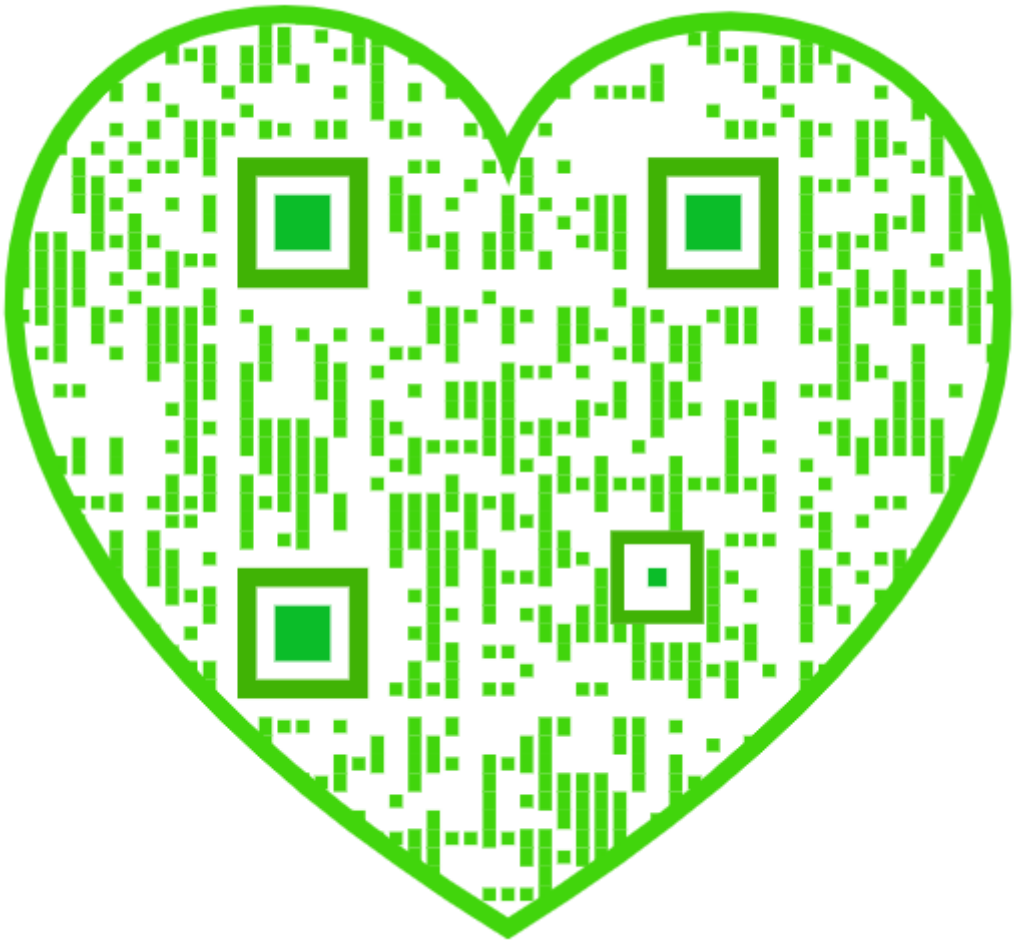
I is the induction tube through which the sparks are drawn by suction from the smoke-box into the cylinder of the pump, one end of said tube being bolted to the end of the plate of the pump cylinder and the other end to the end plate of the smoke-box. J is the eduction tube, through which the sparks are driven by the piston of the pump—one end of said tube being bolted to the end plate of the pump, and the other end opening into the air, or into a receiver containing water, or ether suitable place. K is a valve at the end of the induction tube hinged to the inside of the end plate of the pump, being open whilst the piston is moving toward the head of the pump, and closed when moving in a contrary direction, represented in figure 4. L is a valve in the eduction tube, arranged so as to close when the valve, K, opens, and to open when the valve, K, closes, being hinged to the outside of the end plate of the pump. M is the piston rod of the steam cylinder. N is the piston rod of the pump. O is the cross-head connecting the piston rods, M, N, together, causing them to work simultaneously in the same direction. P' P' are the parallel guides for the steam cylinder cross-head. P'' is the guide for the cross-head of the pump. Q is the crank axle of the valve, G. R is the rod for turning the crank axle. S is the opening in the valve, G, surrounded by the short pipe, S', attached to the valve and closing down over the united ends of the steam pipes, F, which conduct the escape steam through the same, whilst the valve, G, prevents the escape of the smoke and sparks through the stack. The valve, G, is brought to a horizontal position for closing the smoke stack when the pump is in operation, and is turned to a vertical position, or opened, when the engine is at rest. T T are the cocks for allowing a portion of the exhaust steam to escape into the smoke-box for the purpose of extinguishing the sparks and to prevent the pump becoming over-heated, the steam being partially condensed in the smoke-box. U is an inclined guard for giving the fire a downward direction to prevent the ascent of the same amongst the machinery. The pumps are combined with and secured to the smoke-box by means of the braces, Y, and steam-chests, V, adapted and fitted to the sides thereof, by making the undersides of the flanges of the pump concave and corresponding with the convex sides of the flanges of the steam cylinders, and properly secured upon them in any permanent and durable manner, by means of double concave plates, X, secured to the sides of the pump and cylinder by the screws, x or in any convenient manner. A similar pump and arrangement of parts are combined with the other steam cylinder for a like purpose, similar letters being used for similar parts.

The several parts of the apparatus may be

Figure 2.



© 1851 SCIENTIFIC AMERICAN, INC.

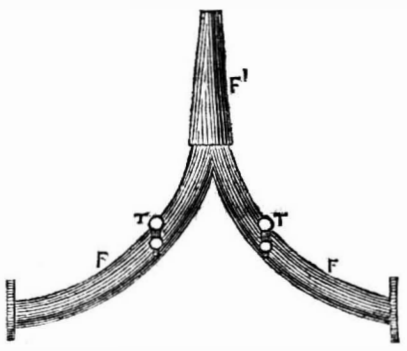


constructed, arranged, and operated in any convenient way or manner for producing results similar to the above, by means substantially the same as those above described.

The head of the pump may be made concave on the inner side, or of an obtuse angle shape, or in two segments or semicircles—the upper segment being stationary and bolted to the cylinder and the lower segment hinged by its straight side to the straight side of the upper segment to answer as a valve for preventing clogging from an accumulation of sparks in the pump, the end of the eduction tube bolted to the outside of the head of the pump being made sufficiently large to embrace and cover the said lower segment of the head which is to serve the double purpose of a head and valve—which arrangement would require the eduction tube to be bolted to the circular flange of the pump instead of the head of the pump, as described.

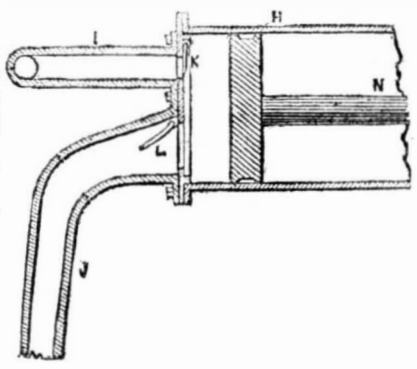
The parallel guides, P′ P″, are sustained in their required position by the plate, *b*, fixed to the end of the cylinder, and the plate, *z*, secured to the frame of the engine by the brace or arm, *a*. On firing up the engine, the valve, G, must be turned to a vertical position by moving the rod, R, to which it is attached; the furnace and engine being in full operation, and it being required to prevent the sparks escaping from the smoke-stack, the engineer

Fig. 3.



must move the rod, R, longitudinally, which will turn the valve, G, to a horizontal position —the aperture in the same surrounded by the additional pipe, S′, allowing it to drop over the upper end of the exhaust or escape steam-pipe, F′, thus shutting off the communication between the smoke-box and the smoke-stack, E; the cocks, T T, are then partially opened, which allow a portion of the waste steam to enter the smoke-box in quantity sufficient to extinguish the sparks, and regulated by said cocks, the main body of the waste steam being

Fig. 4.



allowed to escape in the usual manner through the chimney or stack, it being unnecessary to allow all the waste steam to enter the smoke-box and pumps, as it would create an undue pressure on the several parts.

The following are the claims of this patent, and, with the full evidence of what they are, we would state that Mr. Wade is prepared to sell rights, and any communication addressed to him will be promptly attended to :—

"I claim pumping the sparks from the smoke-box of a locomotive engine, when the sparks are extinguished, or partly so, by the introduction of a portion of the escape steam through the cocks, T T, substantially in the manner and for the reasons stated. I also claim the arrangement of the valve, G, in the smoke stack, E, as constructed, with the short pipe, S′, in combination with the united steam pipes, F, for preventing the escape of the smoke and sparks during the operation of the pump, and, at the same time allowing the waste steam to escape through the smoke pipe, E.

[Special Correspondence of the Scientific American.

The Great Industrial Exhibition and Incidents Connected Therewith.

London, May 31st, 1851.

Since the shilling admissions have commenced, although it was confidently anticipated that the great building would be innundated, the current of people, strange to record, has visibly fallen off, from a prevailing impression through the country that the crowds would be so great that there would be little comfort experienced in a visit. During the half-a-crown days, which occur once a week, the tide swells up to the old five shilling average; but in a week or so more, when the railways have commenced what they call "cheap trips to London," from the interior of the country, it will even surpass antecedent great return days. The bulk of stranger visitors now are French and Germans, and there are a goodly number of Americans, but not a circumstance of what were expected from the representations made by the American journals.

Queen Victoria and suite are daily visitors, and they take a lively interest in every proceeding connected with this great work of modern times. The Prince, especially, and the old Duke of Wellington, spend one third of the week, one way or another, in looking after the interests and arrangements. This is gratifying, as it sets a pattern to the nobility and gentry, who are slow to act unless they receive an impetus by royal example.

The list of prizers has at length been made known, much to the satisfaction of the numerous exhibiters, who were anxious to learn the class and character of the men who were to decide upon the intrinsic merits of their works. We think much judgment has been shown in the selection of the Council of Chairmen, among whom we find, for instance, in the department of machinery, the eminent Sir David Brewster, and the Earl of Jersey, a practical and a capable professor. In the metallic, vitreous, and cerianic manufactures, are the Duc De Suynes, a celebrated Prussian philosopher, and Horace Greeley, of New York City, of whom comment would be superfluous. In vegetable substances, used in manufactures, we find the name of Professor Richard Owen, F. R. S. In philosophical instruments, the name of Sir John Herschel stands pre-eminent, and in the sub-jury of musical matters come Sir George Smart, Sir Henry Bishop, and the great Thalberg. In sculpture, models, and the plastic art are the famous Panizzi, Wigon, of the Royal Academy, Lord Holland, and M. Quetelet. We also find Horace Greeley, Esq., (who is announced as an Honorable), elected as Chairman of the Iron and Hardware Department: his associates are stated to be capable gentlemen.

The United States division does not attract as much attention as we should like. The most striking features are the Greek Slave, (which is flocked by the *dillentanti*); the large display of Goodyear's india rubber garments; Pirsson's pianos (which Thalberg has pronounced the finest from the United States); an iron double salamander safe from the warehouse of Silas C. Herring; a huge mass of zinc ore; a collection of perfumery by Roussel, of Philadelphia, and a number of small and ingenious articles, which we do not now remember. We notice with pleasure that some thoughtful American has made a collection of all of the papers published in the State of New York, and bound them in volumes of each county. The City of New York collection excites considerable attention among the English visiters, who marvel at their cheapness and beauty of typography: a "Brother Jonathan" they deem a very mammoth, as in truth it is, and they cannot imagine how a New York "Sun" can be sold for a cent, when they have to pay eight and ten cents for the least morning paper.

There is now no room left to doubt the great good the Crystal Palace has brought about. Where are the dissenting Chartists? Why have the Red Republicans kept so quiet, when, according to the officious statements of the New York "Herald" and the London "Chronicle," they were preparing to wage death and destruction by their vicious co-operation with the rabble concentrated of all the civilized world. The socialists are as quiet as mice, and never did harmony reign so supremely general as it has during the whole course of the Exhibition from its projection until the present time. We cannot but admire the various instances of liberality and kindness on the part of many distinguished gentlemen, all of which have been called forth by this *monster*, as some of the press sneeringly and satirically styled it. As an instance, we see it stated that Lord Leigh has invited all of his numerous tenants to visit the Palace at his expense, and W. Brown, Esq., Member of Parliament from South Lancashire, and head of the well-known firm of Brown, Shipley & Co, has given £20 to each of his forty or fifty clerks to enable them to visit, without trenching on their ordinary finances, the Exhibition during the season. Again, the Admiralty have granted their dock-yard workmen, for the same purpose, leave of absence for two days, and we learn they also have agreed to pay a certain portion of the expenses of the artificers who have availed themselves of the permission. A general leave to the army has also taken place to all regiments at home, from the 1st of June to the 30th: one field officer, half the captains, and half the subalterns to be allowed the indulgence each fortnight in the month. We suppose, also the numerous Charity Schools will come in for a general holiday, and if we mistake not, ere this, the Royal Commissioner has entertained the idea.

We believe. with the single exception of the Russian Department, the Exhibition may now be deemed complete. From some statements we have seen, the Russian collection will be one of the most wonderful and attractive in the Exhibition. The jewelry arrived is valued at $200,000, and it is said will quite eclipse the brilliant display sent by the Queen of Spain. Among other matters is a pair of folding-doors, valued at $40,000, of most valuable malachite, from Siberia, belonging to the Prince Demidoff. There are also chimney-pieces, arm-chairs, and cabinet furniture of the same precious stones. There is an enormous candelabrum, in ormula in dead steel, upwards of 14 feet in heighth, and one in silver, representing a group of armed knights dismounting under a fir tree: the workmanship is exquisite, and it weighs upwards of 2 cwt. of silver.

The American Department is called "The Prane," and each country appears to receive some characteristic appellation by which it is known. The American visitors are requested to register their names in a book provided for the purpose, and on a hasty examination we find there have been about five hundred visitors from the United States, the bulk of whom hail from New York and Virginia.

A writer in the London Expositor, a paper devoted to inventions, designs, art, and manufactures, calls attention to the vehicles from the United States, and argues that they surpass in elegance of design and beauty of workmanship anything of the sort manufactured in England. The same writer also praises the solar lamp by Cornelius & Co., of Philadelphia, and a bell telegraph from New York. He deems them very important inventions, and as he is a man of weight and judgment, perhaps his dictum will have some weight with the jurors. We fear that the Americans will gain but few, if any prizes, as the jurors, with very few exceptions, are Europeans of various countries, and it is but natural to suppose they will take cognizance of the improvements of their own nations before those of any other that may present themselves for inspection, no matter how strong their claims. H. H. P.

Soap a la Rose

This is made of the following ingredients: —30 pounds of olive oil soap; 20 of good tallow soap. Toilet soaps must be reduced to thin shavings, by means of a plane, with its under face turned up, so that the bars may be slipped alongit. These shavings must be put into an untinnedcopper pan, which is surrounded by a water bath, or steam. If the soap be old and hard, 5 pounds of water must be added to them; but it is preferable to take fresh-made soaps, which may melt without addition, as soap some time kept does not readily form a homogeneous paste. The fusion is commonly completed in an hour, or thereby, the heat being applied at 212° Fah., to accelerate the process, and prevent the dissolution of the constituent water of the soap. For this purpose the interior pan may be covered. Whenever the mass is sufficiently liquefied, 1¼ ounces of finely ground vermillion are to be mixed, after which the heat may be taken off the pan; when the following perfumes may be added with due trituration :—3 ounces of essence of rose; 1 ditto cloves; 1 ditto cinnamon; 2½ ditto bergamot.

Transparent Soaps.

These soaps were for a long time manufactured only in England, where the process was kept a profound seeret. They are now made every where. Equal parts of tallow soap, made perfectly dry, and spirit of wine are to be put into a copper still, which is plunged in a watter-bath, and furnished with its capital and refrigeratory. The heat applied to effect the solution should be as slight as possible, to avoid evaporating too much of the alcohol. The solution being effected, must be suffered to settle; and after a few hours' repose, the clear supernatant liquid is drawn off into tin frames, of the form desired for the cakes of soap. These bars do not acquire their proper degree of transparency till after a few weeks' exposure to dry air. They are now planed, and subjected to the proper mechanical treatment for making cakes of any form. The soap is colored with strong alcoholic solution of archil for the rose tint, and of turmeric for the deep yellow. Transparent soaps, however pleasing to the eye, are always of indifferent quality; they are never so detergent as ordinary soaps, and they eventually acquire a disagreeable smell.

Windsor Soap.

Take common hard curd soap 56 lbs., oil of carraway 1¼ lb., tincture of musk 12 ounces, English oil of lavender 1 ounce, and oil of marjoram 4 drachms.

Starkey's Soap.

Rub together in a mortar subcarbonate of potash with oil of turpentine.

Soap au Boquet.

30 pounds of good tallow soap; 4 ounces of bergamot; oil of cloves, sassafras, and thyme, 1 ounce each; neroli, ½ ounce. The color is given with 7 ounces of brown ochre.

Cinnamon Soap.

30 pounds of good tallow soap; 20 ditto of palm-oil soap. Perfumes :—7½ ounces of essence of cinnamon: 1¼ ditto sassafras; 1¼ ditto bergamot. Color:—1 pound of yellow ochre.

Orange Flower Soap.

30 pounds of good tallow soap; 20 pounds of palm oil soap. Perfumes :—7½ ounces essence of Portugal; 7½ ditto amber. Color:—9½ ounces, consisting of 8¼ of a yellow-green pigment, and 1¼ of red lead.

Musk Soap.

39 pounds of good tallow soap; 20 ditto palm-oil soap. Perfumes:—Powder of cloves, of pale roses, gilliflower, each 4½ ounces; essence of bergamot, and essence of musk, each 3½ ounces. Color:—4 ounces of brown ochre, or Spanish brown.

Bitter Almond Soap.

Is made by compounding, with 50 pounds of the bestwhite soap, 10 ounces of the essence of bitter almonds.

Lowell Mechanics' Fair.

We would call attention to the Mechanics' Fair which is to be held in Lowell, as set forth in an advertisement on another page. We are positive that it will be a far better display of American inventions, in every department of art and manufacturing, than at the great Exhibition.

The Locust has no Sting.

Dr. Gideon B. Smith, the distinguished naturalist, has made enquiry into all the recent reported cases of death an sickness from the sting of the locust, and the result of his inquiry is, that no one has yet been injured by the sting or bite of a locust.

© 1851 SCIENTIFIC AMERICAN, INC.

(For the Scientific American.

Electro-Magnetism as a Moving Power.

Your paper of the 24th ult. contains some remarks upon the subject of Electro-Magnetism as a moving power, which seem to require a brief reply "at my hands." Firstly,—the writer takes unnecessary pains to show that electro-magnetism is far inferior to steam as a motive power—a fact never doubted by any one conversant with the subject; and he further supposes that persons investigating electro-magnetic power are not generally "acquainted with the economy of steam." I cannot agree with him, but, on the contrary, I do not consider that a person can be well qualified to investigate this subject without being very likely to possess a competent knowledge of the economy of steam; and I have never yet met with an investigator of electro-magnetism who did not evince an acquaintance with steam power. Upon the subject of steam we have enough written, and "he who runs may read;" but upon electro-magnetism there is a great dearth of published matter, and the subject itself is recondite and difficult. Your writer, in referring to my preference for the rotary form of the engine, says, I have "fallen back upon Davidson's and Avery's plans." As to Davidson's engine, it was fully tested by myself on a large scale in Boston, in 1837, and it was invented and tried in Baltimore by Dr. Edmonson, in 1834. [See Silliman's Journal]. But your writer misapprehends the case: I have "fallen back" upon no one. The rotary form of the axial engine, as well as the reciprocating, differs most essentially from any engines ever before tried. In my reciprocating engines, the *magnetic piston*, if I may so call it, is impelled with nearly an equal force throughout the stroke, and this for any length of stroke desired. The rotary axial is the perfection of the improvement, and does not seem to involve the difficulties inherent in rotary steam engines, for my *pistons* require no *packing*. When the description of my engine is published, which will be ere long, I think your writer and others will appreciate its peculiarities, and I hope he will suspend his judgment till he has an opportunity of being well acquainted with its details. I have never claimed for electro-magnetic power that it is or would be, superior to steam, that is, in every respect, nor is it necessary that it should be, to answer the purposes of my investigations. The cost of the power has been with me a subordinate question, knowing full well that other more important questions had to be settled first before ever the cost could be fairly ascertained. The abstract rule laid down by M. Joule, Messrs. Hunt, Scoresby, Oersted, and others, of the absolute duty performed by a given quantity of zinc, is well enough as far as their experiments went, but is of little or no value in the practical question of the availability of this power. To illustrate my meaning, take the highest duty of coal in the best condensing engines in the world; will any one pretend to say that there is no room for improvement even there? Why, in the Cornish engines, within a few years, the expense of a horse-power has been reduced from 10d. to 2d. per diem. But suppose it be admitted that the minimum cost has been attained; how many engines in the world can be worked as cheap as those engines? In reality, M. Joule's calculation makes the expense of magnetic power less than is steam power at the present day in some of our locomotive engines. The cost, therefore, I say, is not the practical question, and if the magnetic power will cost more than the dearest steam power, still, if we render it an *available* power in other respects, it must come into use for many and perhaps most purposes, by reason of its great advantages over steam in point of safety, simplicity of construction, readiness for operation, compactness of machinery, and, lastly, one very important condition, viz., there need be no consumption of material when power is not wanted for use.

Your writer is a friend to progression in art and science, liberal and candid, but in running so severe a parallel between magnetic and steam power he disparages the former, and, in effect, discourages the new enterprise. The comparison is unfair for magnetism, for it is yet in its infancy, and steam is full grown. The proper appreciation of magnetic power is to be had by comparing it with steam in an equal stage of its developement, when it will be seen that the magnetic power rather carries the palm. Steam power has not yet reached its climax, but it seems as if it were approaching its culmination, as its march seems to be comparatively slow; while magnetic power, evidently in its inception, is progressing rapidly. The first steam locomotive applied in England, in 1804, made, on a level plane, five miles an hour wrth about 15 tons, and ten years after, the celebrated Mr. Stephenson constructed a locomotive which was considered a great improvement, and carried eight carriages, about 30 tons, four miles an hour; and in 1829, after 25 years of experience, (and all the while "invention was stimulated by necessity"), Mr. Stephenson produced his locomotive, the ROCKET, whichmade an average speed of 15 miles an hour, with 17 tons, consuming about one pound of coke per mile to a ton, as in the two trips of 70 miles, 1,085 lbs. of coke were consumed. With my magnetic locomotive just as it is, I would willingly have entered the *list* with the Rocket in point of power, speed, and expense of working. I feel confident, however, that the magnetic locomotive is capable of carrying two loaded passenger cars to Baltimore at the rate of 20 miles an hour, as soon as some of the very great and obvious defects are remedied.

I had lately an opportunity of seeing how great was the friction of the machinery of the locomotive. They have at our station here, one of the largest and strongest horses I ever saw, and he is well trained to the work of pulling cars. In removing the magnetic car from its station, this horse was attached to it, but was found to be unable to pull it up the grade over which the car was propelled by magnetism 6 miles an hour. It required five men and this horse to get the car over this grade, and it was lighter by two tons than when driven by magnetic power; and moreover, when it ascended this grade at six miles an hour, the power of the battery was not fully up; and I have discovered a cause of great additional friction when the engine was in action, the remedy for which is obvious.

In regard to the doctrine of Liebig, that the zinc cannot give out more power than the coal required to smelt it, it is unfortunate, and though entertaining the highest respect for his reputation and ubility, I must pronounce it a *practical absurdity*. It is reasonable to suppose that a given amount of zinc combining with oxygen, would not eliminate more heat than would be required to overcome this affinity, but we have no proof of any such relation of electricity to heat as to make the mechanical power of the one the measure of the mechanical power of the other. Whatever may be the connection and analogy between heat and electricity, we must consider them as distinct forces, in their mechanical relations. In the combustion of coal we develope heat as the motive force, and no electricity; in the oxidation of zinc in the battery, we develope both heat and electricity, the latter only being the motive force. The *absolutism* of forces regulating affinities, may be interesting as a matter of speculation, but, as furnishing a practical estimate for the amount of mechanical or available power, it cannot stand, and necessarily involves the unwarrantable assumption that the whole power or inherent force may be eliminated and rendered available in each case. But Liebig goes still further: he maintains that the heating power of the current is the equivalent of its mechanical power through electro-magnetism; or, in other words, that the heat developed by the passage of the current ought to raise steam enough to furnish a power equivalent to the electro-magnetic power of the same current, and from the fact that the mechanical force derived from steam raised by the heating power of the current is so small compared with that obtained by the combustion of coal, he arrives at the conclusion that electro-magnetic power "can never be used." The speculation is thus pursued up to a point where facts are brought in to its support, and fortunately where facts enough can be adduced to subvert the whole doctrine. I will take but one, and one that can be easily admitted; or, rather, I will propound a question: "how many pairs of plates would be required to operate through their calorific or steam power the lever of the receiving magnet in Morse's telegraph, say through a circuit of 80 miles? I saw an experiment some years ago at the Capitol, when gunpowder was fired through this length of circuit, the powder being at the Capitol and the battery at Baltimore. Fifty pairs of Grove's battery, such as they used for the telegraph, would not ignite a platinum wire one-thousandth of an inch in diameter. It finally required 75 pairs to fire the powder. Ten pairs of such plates will work the receiving magnet through this circuit vigorously. I leave it to mechanical minds here to form their own conclusions. The truth is, that the cost of electro-magnetic power, or any other power, is circumstantial, and the attempt to predicate the whole economy of magnetic power upon the cost of coal and cost of zinc, and the fact that coal is found native and zinc not, is, in effect, to make nature's laws and operations amenable to market prices and other contingencies. Yours, &c. CHAS. G. PAGE.

Washington, D. C., June 3, 1851.

[This communicatian will be answered next week.

Floating of Rafts.

In number 38, in the article about floating rafts, we said, "a person not satisfied with our answer should assign a reason." The author of the letter therein is not satisfied, and presents his theory; it is this, "rafts are carried to their destination by the force of gravity merely, independent of the motion of the water in the said direction." The raft," he says, "would float down the river if its motion, (the water's) could be arrested entirely." This is his theory, and we do not say, *we are not satisfied*, he is welcome to his opinion. But let us show how he reasons against his own theory—he considers the bed of the river an inclined plane, and says, "the water lubricates the inclined plane, and the greater the quantity of water contained within the bed of the stream, the greater the motion of both raft and current, because the distance from the bottom and banks, and the portion of the water retarded by friction against them, is thereby increased and the direct motion of the water less interfered with by the revolving or eddying motion consequent on that friction." That's it exactly friend; don't you see it is the water that carries the raft along—that gives it momentum. Now stop the current friend, according to your theory, and see how fast the raft will travel. Ah, you will say, "then we shall have no inclined plane." True, for we never bring up an impossibility to prove anything. We happen to know something about rafting personally. We lay down the following proposition;

1st. Rafts are carried by the motion of the current, and receive their momentum from the water.

2nd. The momentum imparted to the raft deprives the moving body (the water) of a quantity of force equal to that which it, the raft, receives.

3rd. It is gravity which moves the raft, but not its own, it is the gravitating force of the water; to prove this, a log will lie on an inclined plane of boards of 50 feet inclined to the mile, till doomsday, while it will be moved along with the water, having only a descent of 5 feet to the mile.

4th. A body of less specific gravity than another, and partly merged in it, could not move, by the known laws of gravity, unless the sustaining body moved. This is the case with the log and the water.

5th. The speed of the raft will be according to its form, the rougher and heavier, the slower.

6th. Some water moves as fast as the raft.

7th. The velocity of the river is according to its incline, form of its bottom, and banks.

8th. The water in the middle of a river has a greater velocity than that at the sides, and the surface greater than that at the bottom.

9. It is common for the surface water in rivers to travel 10 miles for the raft's 4, and yet the raft be nearer the end of its journey. This is owing to bends and contractions in rivers. Raftsmen know this, and rafts without raftsmen to guide them make mighty fine trips on rapid crooked rivers—a great deal faster than the water, eh? Ask an old raftsmen. A river carrying a raft is just like a great number of *bearers* who take the load one after another and carry it along on their shoulders. At every bend of the river, there are two gangs, the one shoots off at an angle and takes a long round about road, and the other is slower but takes a shorter road; the raftsman takes the slower but shorter road, and this is the reason why the raft gets ahead of the water.

10. The surface of the water and the raft will move with equal velocity for 100 miles, if the line of the river is straight and the banks smooth. It is wrong in mechanical language to say "a body moves by gravity," when it is carried by another.

N. B.—We have recieved a communication from a new correspondent who says "the raft has a tendency to move to the centre of the earth by gravity, and this is what causes it to move, and it would go there, only for the resistance of the earth and water beneath it, and the air above it." He does not appear to be aware that the air on the surface of a current of water moves along with it.

Next week we will publish a short communication on the subject, which will end the discussion for the present.

(For the Scientific American.)

Iron Ore in Essex County, N. Y.

Tons of ore raised in Essex Co., in 1850:

In Crownpoint—Penfield, 2,000; Hammond, 4,000—none shipped.

In Moriah—By Goff, 7,000, Port Henry Iron Co. ore bed, half a mile from the lake. By Foot, 4,500, Foot's Iron Co., half a mile from the lake. By Hull, 2,500, No. 75 Ore Bed; by Storrs, 4,000, Rousseau Ore Bed; by Miller, 500, No. 50 Ore Bed; by Rousseau, 7,000. Rousseau Ore Bed; by Sherman, 6,000, New Ore Bed; by Lee, 6,000, New Ore Bed—5 to 7 miles from the lake. Doad, 3,500.

Elizabethtown, (supposed), 1,500.

Amounting, altogether, to 48,500 tons of raw ore.

Very little ore is worked up in Moriah, about half of it being shipped to Clinton Co., and the rest to Vermont and other parts of New York, New Jersey, Virginia, and Philadelphia and Pittsburgh, Pa. Mr. Goff has just informed me that, owing to the superior quality and richness of his ore, it will pay shipping to Pittsburgh, Pa.

The ore sells on the dock for $1,75 to $3,25, raw, and for $2,25 to $4,50, separated.

A new bed of superior ore, about 2 miles from the lake, is being worked this year.

Product of the Moriah ore mines in 1850:—13,666 tons raw ore, average value on the dock $2,25—$30,748,50; 27,332 tons separated ore, average value $3,25—$88,832,25; total, $118,580,75.

But the depression of the iron business and competition has shorn mining of its profits.

CLARK RICH.

Port Henry, N. Y., June 6, 1851.

Natural Soap in New Mexico.

John Gorman, Assistant Marshal, who was engaged in taking the census of New Mexico, discovered in the Town of Chimallo, in Rio Arriba county, a substance resembling soap. It makes a lather like soap, and has the property of removing grease spots or stains out of any kind of cloth. When put in water it immediately slacks like lime. At the place where the discovery was first made, it is even with the surface, and about fifteen yards square. It is rotten on the top to about the depth of three feet, but appears cleaner and sounder at greater depths. It can be taken out in large lumps, of ten or fifteen pounds weight. It is as white as snow, and seems to exist in large quantities. Specimens have been forwarded to the Census Office at Washington.

If one ounce of powdered gum trajacanth, in the white of six eggs, well beaten, is applied to a window, it will prevent the rays of the sun from getting in.

© 1851 SCIENTIFIC AMERICAN, INC.

New Inventions.

Machine for Employing the Water-Power of Rivers.

Mr. Joseph Hardie, of Victoria, Texas, has taken measures to secure a patent for new machinery to be submerged in rivers where there is a current, however small, so as to propel machinery on shore by the power of the water. Tidal wheels are old and well known, but very few of them have been employed in our country, and they are not adapted for many of our rivers. What a power there is in the Mississippi river, and yet it flows on to the Gulf of Florida, without applying its giant strength to move—so far as we know—a single mill. A machine to apply this power safely and economically is a desideratum: Mr. Hardie has applied his inventive powers to do so. His water motor is submerged, and is connected with a framework on the bank of the river, which can be elevated or lowered by capstan or windlas, according to the height of the river.

Electro-Magnetic Fire Alarm.

Mr. Henry Van Ausdell, of Eaton, Ohio, writes to us saying he has invented a Burglar's Electro Magnetic Fire Alarm, which is peculiar in a number of particulars. It is of such a nature that any number of houses may be embraced in a circuit, and when one is being injured by fire or entered by burglars, the "alarm" is given at any or all the others, and in such a manner that they can know in a moment the precise point of disturbance; its construction is simple, it consists of a series of two or more circuits (operated by the same battery), one of which is closed by closing doors and windows, which, when broken, releases clock-work, driving a signal wheel operating on the key of the other circuit, &c.

Improvement in Carriage Springs.

Mr. Gustavus L. Haussknecht, of New Haven, Conn., has made an improvement in springs for carriages by employing a combination of the C and the semi-eliptic springs, positioned transversely with the axle, the lower part of the spring being attached to the axle, and the body of the vehicle is made to rest on the upper part, or inner extremity of the semi-eliptic spring. A flexible band is also attached to the C spring, and made to pass over the top of it. The point of attachment or support of the carriage body, in relation to the combined spring, is asserted to be such as to insure great strength and flexibility. The inventor has applied for a patent.

Improved Pump.

Mr. Thomas Ling, of Saratoga Springs, N. Y., has taken measures to secure a patent for an improvemnt in pumps, which is worthy of attention. He employs a water vessel or case named a "Surety Box," situated beneath the plungers, to prevent any leakage of air around the pistons. It is well known that if any air gets under the plungers, the *suction*, as it is commonly termed, is destroyed, this improvement is to obviate that evil.

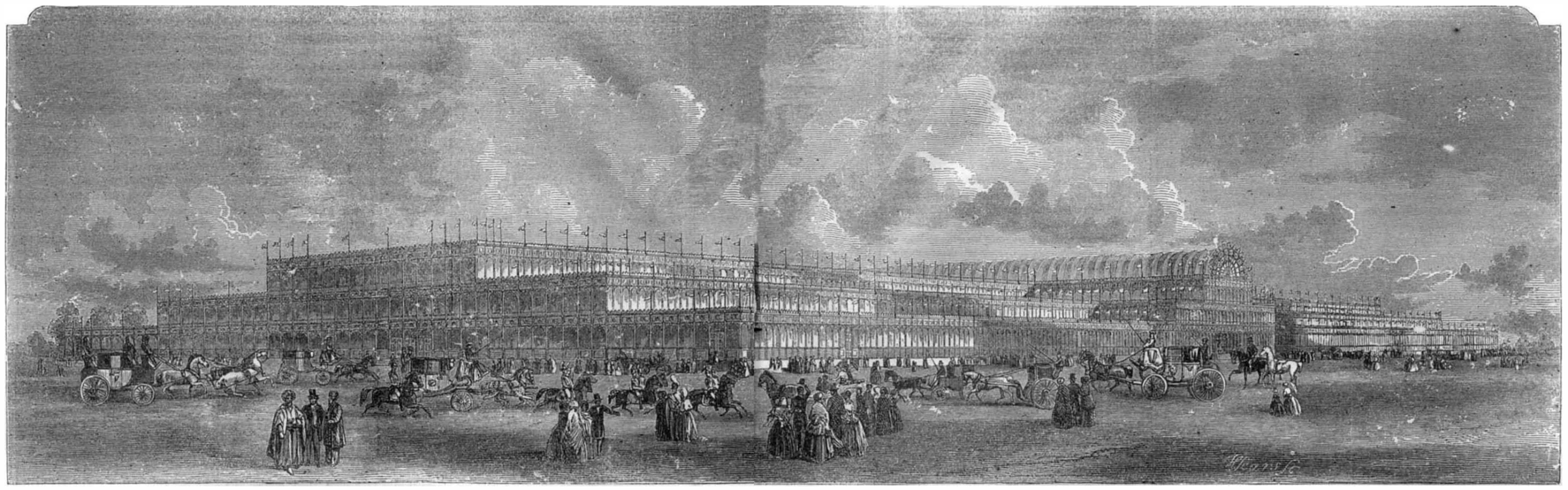
Machine for Printing Oil Cloth.

Mr. Simeon Savage, at the Lowell Machine Shop, has succeeded in the invention of a machine for printing floor cloth, which promises to be of great utility in the manufacture of this most desirable of floor coverings. We will not attempt any description of the construction of this machine, as no patent has yet been obtained for it, although one will be applied for as soon as a model can be built. This machine is capable of printing 2,000 yards of floor cloth per day, in eight different colors at the same time, and by the same principles, twenty colors could be as readily printed. We saw a specimen of floor cloth printed by it, which warranted us in the belief that more perfect goods can be made by this machine, which is worked by power than can be made by hand..—[Lowell Courier.

Gold Hunters.

We see it stated that hundreds of men are leaving the towns of Gardiner, Hallowell, Pittston, &c, in Maine, for the gold mines lately discovered in Somerset county, in that State.

EXTERIOR VIEW OF THE GREAT EXHIBITION BUILDING.



The above engraving is the best view we have yet seen of the Great Exhibition Building, Hyde Park, at least to convey a good idea of its vast extent. We do not intend to say anything about the building itself here, such as its dimensions &c., for by reference to No. 31 all the information required in this respect may be obtained.

The London correspondence which we have published every week since the beginning of last April, has given our readers a vast amount of information respecting many of the articles, &c., therein exhibited. We will only say a few words about the American department of the exhibition. A very large space was allotted to our country in anticipation of a very great number of exhibitors from the United States. This space is not adequately filled up by the articles which have been sent there to be exhibited, nor are the articles, the great mass of them, very attractive so far as show is concerned. This has been a fine subject to make a *handle of*, by Jules Janin, the celebrated French letter writer, a royalist wool-dyed and hater of republicanism; it has also furnished a file for the London Times to sharpen its teeth with, but for all this, we neither feel shame, fear, nor melancholy, all will come out right at last. Our commissioner, Mr. Riddle, has written a letter to the Hon. J. C. G. Kennedy informing him that the Queen and Prince Albert had visited the American Department, and had made a careful examination with great apparent satisfaction. Mr. Riddle described the principal articles, and her Majesty took in her hand some of them, although placards at every step informed her that "Visitors are requested not to touch the goods!" After remaining upwards of an hour in the American section, the Queen expressed to Mr. Riddle the pleasure she had received in her visit.

In agricultural implements, America surpasses all the other nations there, but Great Britain, and stands equal with her. This is gratifying, yea, more, exhilirating, for agriculture is the mother of all arts, and the true thermometer of a nation's solid comforts. Curious visitors, and the journalists who are generally mere literati, without any knowledge of the arts, or machinery, do not appear to take much interest in the American department. The Illustrated London News and the Morning Chronicle are exceptions. The contrast between the plain articles from the United States and the glittering display of other nations is so great, that both critics and visitors make a hasty survey of our bales of cotton, barrels of flour, and agricultural implements. Occasionally groups of intelligent examiners may be seen standing around some particular article, taking notes and consulting together.

"The committee appointed to report on the department of machinery recently made a careful examination of several of our machines; Mr. Brunnel, one of the committee, expressed his astonishment that the Americans had not forwarded to the exhibition a greater variety of valuable inventions, as he knew that we possessed a great number. He mentioned particularly that we had neglected to send a model of our Dry Docks, which he acknowledged were not surpassed by any in the world. In the department of machinery, he said that the United States were able to compare favorably with Great Britain; and he expressed a hope that many of the best machines of our country would yet be sent to the exhibition."

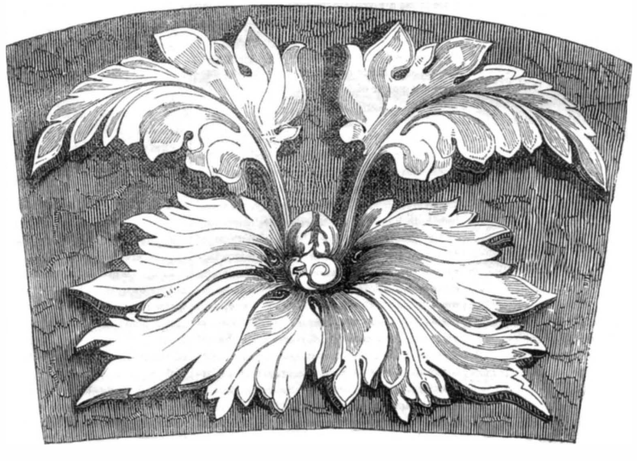
This is true, America is not represented at the great exhibition. We have given our reasons why in No. 37, page 293.

The American carriages at the exhibition are unrivalled for lightness, strength, and simple elegance, this is admitted on all hands.

Specimens of rifles, manufactured by Messrs. Robbins & Lawrence, of Vermont, are justly pronounced by Englishmen as among the best, if not the best, of any rifles in the world. The critic of the Chronicle says they are of an unpretending style, but are remarkable for a plain, substantial, and perfect finish; that they are strong, simple, and thorough in their workmanship, and eminently adapted for real service.

Philadelphia lamps and chandeliers compare favorably with those of other nations. The Morning Chronicle says:—"The casting is remarkable for its fineness, sharpness, and uniformity. The branches formed by arabesque scrolls, profusely ornamented with birds and flowers, delicately sculptured or in bold relief, with centres of richly cut glass, claim particular approval for their elegance and lightness of design. This is among the youngest branches of manufacture in the United States, it being scarcely fifteen years since every chandelier, girandole, mantle lamp, and candelabra used in that country was imported from Europe; and it argues considerable enterprise and perseverance on the part of the manufacturers, that they have attained so much excellence as to be willing to vie in the exhibition with the oldest and most celebrated houses in the world."

ORNAMENTAL BRICKS.



The accompanying engraving represents a style of ornamental bricks, which has recently been introduced into England, and patented by Messrs. Bowers, Challinors & Woolliscraft, of the Staffordshire Potteries. These bricks, or rather they are a kind of pottery ware, are made from a mixture of clay and other ingredients, calculated to vitrify with the clay. They can be painted and grained with the utmost facility, so as to imitate any kind of oak, rose, satin, or other woods, or sculptures in stone, or be gilded without injuring the brilliancy of the gold leaf. They may supply the place of wood carving in architectural decoration, and, from their fire-proof nature, add to the safety of the buildings. Some ornamental bricks were employed in this city about ten years ago; how they came to be disused, we cannot tell, but we think they are worth reviving, for certainly they appear to us well adapted for ornamental architectural purposes, both inside and out, such as for internal and external decorations of churches, public buildings, mansions, houses, and shops, cornices, mouldings, skirting boards, to match in design any style of architecture, or the taste of any private individual.

Fire Annihilator.

A great fuss is now being made about a fire annihilator which is to render fire companies useless and lay our firemen on the upper shelf of inglorious repose. Our daily papers have been flaming for a few weeks past with wonderful accounts of its extraordinary powers. One of our contemporaries says "it is an English invention and has been strongly recommended by many principal officers in the Royal Navy and well-informed commanders in the merchant service; and Lord Brougham recently said that he hoped before long no vessel would be allowed to put to sea without having some of these machines on board. It is a little singular that an invention which is said to rank in value with that of the steamboat, the telegraph, the cotton gin, and the railroad, has never been introduced here, if it be as valuable as asserted. It would certainly be immediately adopted, if it were discovered to possess value."

This is sensible, but we see that a G. Q. Colton, writing from New York to the Boston Transcript, gives it a most astonishing character, such a one indeed, as would lead us to suppose that one of the fire annihilators, about the size of a pail, would extinguish a seventy-four gun ship in a twinkling. This fire annihilator is the invention of a Mr. Philips, in London, and was patented by him about three years ago. We noticed it on page 237, Vol. 4, Scientific American. The apparatus is only a device to generate, *choke damp*, (carbonic acid gas) suddenly so as to put out the flame. The principle of the invention is old and well known. It is simply a means whereby some sulphuric acid may be poured upon moist chalk or powdered marble to generate the gas, and let it get among the flames. It is an appartus that may be very useful to keep in dwellings, but it never can supercede our fire engines, and in London it has failed to accomplish on a large scale that which it seemed capable of doing on a small scale. It would be very useful on ships, but it has been too highly flattered by far.

Patents.

During the past year our patent business has increased very rapidly; this is owing to the promptness with which we attended to our business, and the care we exercised to see that it was well done. We take no personal interest in any invention, therefore we have no selfish partiality: everything is strictly confidential—and our motto is "small profits but quick returns." We have lately engaged additional assistance in our draughting department, and are enabled to invite more applicants for patents to consider the advantages we possess in applying for the same. Our experience is of no ordinary consequence, and if inventors take into consideration that a specification, with its drawings, is like a bill—a legal document—they will see that it requires to be carefully drawn up and correctly executed. If a man will have a patent, let it be well done—a good one. Every week patents are surrendered and re-issued at a vast expense, owing to originally bad specifications. It is better to have no patent at all, than one that is defective in any one point. We are very careful in preparing documents so as to meet all future contingencies.

Tanning Notice.

Next week we shall publish the full specification of "Hibbard's process of tanning."

Crystal Palace for Sale.

The splendid engraving of the Interior of the Great Exhibition Building, London, measuring 19½ by 13½ inches, and printed in No. 31, present volume of the Scientific American, will be sold at the low price of $25 upon application at this office.

The above engraving cost, to import, over $150, and the impressions taken from it have not injured it in the least.

The external appearance of the industrial building represented in this week's number and the best and most correct view published, will also be sold to match the Interior View, price $15, deliverable on the 1st July.

A correspondent of the Builder has communicated a very simple method of preventing damp walls, by the mere outside application of a lather of soap and hot water, and then, as soon as dry, sprinkling the wall with a saturated solution of alum. He states that he prepared several places in this way, and water poured on the wall ran off as from a duck's back, without producing the least effect.

Ruttan's System of Ventilation.

In describing Mr. Ruttan's system of ventilation on page 299, we made a mistake in the name. The name of the inventor is Henry Ruttan not John as we had it. In the vicinity of Boston, there is a school and dwelling house in the course of erection, which are being built to carry out his system; he would like if there was a school house or small dwelling erected in New York to carry out his system; he would be willing to devote his time and personal expenses, the owner merely paying for the workmanship and machinery for warming the air. He could instruct by letter any person how to put up the building until the floors were laid down, when he would come to New York and personally superintend its completion. This is a generous and manly offer, and exhibits the confidence Mr. Ruttan has in the superiority of his invention. The ventilator illustrated on the page referred to, is for burning wood, but it could be made to burn coal just as well by adding a coal grate. One of these apparatus may be seen in Boston, No. 11 Franklin street.

Application for Extensions of Patents.

U. S. Patent Office.

On the petition of John and Charles Hanson, of England, praying for an extension of a patent granted to Benjamin Tatham, jr., and H. B. Tatham, as assignees of the said Hansons, on the 29th of March, 1841, for an improvement in making pipes or tubes of lead, for seven years from the expiration of said patent, which takes place on the 31st day of August, 1851. It is ordered that said petition be heard at the Patent Office on Monday, the 18th day of August, 1851, at 12 o'clock, M.; and all persons are notified to appear and show cause why said petition ought not to be granted. Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

On the petition of Reuben Daniels, of Woodstock, Vermont, praying for the extension of a patent granted to him October 7th, 1837, for an improvement in shearing machines, for seven years from the expiration of said patent, which takes place on the 7th day of October, A. D. 1851. It is ordered that the said petition be heard at the Patent Office on Monday, the 15th day of September, 1851, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition should not be granted. Persons opposing the extensions are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

On the petition of Richard Imlay, of Philadelphia, Pennsylvania, praying for the extension of a patent granted to him on the 21st September, 1837, for an improvement in the modeof supporting bodies of railroad cars, &c., for seven years from the expiration of said patent, which takes place on the 21st September, 1851. It is ordered that the said petition be heard at the Patent Office, on Monday, the 1st day of September, 1851, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition should not to be granted. Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the patent office, which will be furnished on application.

On the petition of John Thomas, of Plainfield, New Jersey, praying for the extension of a patent granted to him on the 26th of December, 1837, for an improvement in drying docks, for seven years from the expiration of said patent, which takes place on the 20th day of December, 1851. It is ordered that the said petition be heard at the Patent Office on Monday the 24th day of November, 1851, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted. Persons opposing said extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Thos. Ewbank, Com. of Patents.

© 1851 SCIENTIFIC AMERICAN, INC.

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING JUNE 10, 1851.

To Chas. F. Brown, of Warren, R. I., for Balanced Rudder.

I claim the employment, for the purpose of steering ships and other vessels in water, of two rudders, hung upon and at equal distances from the same centre of motion, and with their surfaces parallel, or nearly so, with each other, in such a manner that the same resistance is offered to each by the vessel's motion through the water, and both are balanced substantially as herein described.

[See an engraving of this patent in No. 34, Scientific American.]

To Davis Dutcher, of Springfield, N. Y., for improvement in Churns. Ante-dated Feb. 15, 1851.

I claim the combination and arrangement of the arms (two) with their rollers (two), which are controlled by the crank and the swinging arms (two), with their floats (two) kept in proper place, both in churning and gathering and working the butter, by the resistance of the cream, as herein described and shown.

To T. W. Hill, of Leominster, Mass., for improvement in Comb Cutting Machines.

I do not claim the mere use, in a die of a clearer for forcing out of the die, the article produced thereby, but I claim the combination of the two series of lifters and bent levers N, (arranged upon the travelling carriage) with the pressure roller, in such manner, that the continued motion of the carriage, shall operate the lifters after the combs are cut, substantially as described.

To Robert Newell, of New York, N. Y. for improvement in Fermutation Safety Locks.

I claim, first, the application of the lever, B 5, and dog, B 6, with the tusk, 40, to be acted on by the talon, 39, and allow the spring, 38, to throw the tusk, 40, into the notches on the lower part of the followers and auxiliary followers, so as to prevent any portion of these parts, if any of the tumblers are lifted after any end shake motion has been given to the bolt, by any improper attempt to unlock it.

Second, The combination of the tumblers, A, slides B 1, and follower, A 9, through the tenons, 18, notches, 30, tongue, 29, and jaws, 24, to lift the slides, B 1, and followers, A 9, to the same extent as the tumblers, A, and lifted by the key sections on locking the bolt, and to sustain the slides, B 1, until the tusk, 34, takes the notches, 31, on the slides, and holds them so that the bolt cannot be retracted until all the tumblers, A, are lifted to meet the notches, 30, and allow the springs, 25, levers, A 0, and auxiliary followers, A 8, to lift and place the followers, A 9, in the same position as when the bolt was projected, substantially as described.

Third, the mode described of so arranging and combining the cylinder, C 4, by the flanches, C 5, angles, 60, tumblers, C and A, and pins, 47 and 49, with the detector lever, D, at the part C 1, as that no one of the tumblers, A, can be separately lifted without placing the part, C 3, of the detector lever over the key hole, with the edges of the notch, 55, covering the open space around the drill pin, 57, by which arrangement no movement of the cylinder, C4, can be made without producing the same effect, so that if powder is introduced into the cylinder, C 4, and the cylinder is moved, with the intent of entering a blow-pipe to spread the powder on either side of the cylinder, the part C 3 and notch 55 instantly cover the key hole and prevent the entry of the blow-pipe for such a purpose; these parts being constructed, arranged, and operating substantially as described.

Fourth, the combination of the cylinder, C 4, block, 62, and hole, 63, to receive and pass out any gunpowder put in for the purpose of exploding, to destroy the lock, and at the same time, prevent the powder from reaching any other part of the lock.

Fifth, the application of the safety-valve block, 64, to vent the explosion of any gunpowder that may be confined in the cylinder, C 4, by plugging both the key hole and the hole 63.

Sixth. The mode of fitting the key hole cover, C 3, with the notch, 55, in the detector lever, D, to match the neck, 56, on the key shank; such means also preventing the introduction of any pick or false instrument, after any movement has been given to the cylinder, C 4, by the notch 55, being as small as the drill pin, 57.

Seventh, the application of the guard-piece, 65, on the detector lever, D, to prevent a pick reaching the pin, 45, of the detent dog, B 8.

Eight, the application of the cam pointed piece, C 6, on the detector lever, D, to move the pin, 47, and detent dog, B 8, so attached, that if the key hole cover is cut or drilled off, the piece, C 6, falls away and leaves the detent dog, B 8, still holding the bolt.

To I. S. Richardson, of Boston, Mass., for improvement in Churns.

I claim, the combination of the rock shaft, levers, connecting rod, and swing for the churn, for the purpose of producing the perpendicular movement of the dasher, substantially in the manner herein described, to be denominated the Oscillating Perpendicular Dash Churn.

To A. C. Arnold, of Norwalk, Conn., for improvement in crossing the fibres in forming the bats for felt, cloth, &c.

I claim, first, the employment, for the purpose of carrying webs, sheets, or layers, of any fibrous material, of an apron of material pervious to air, having a box in which a vacuum is produced placed at the back, the side of the boxt next the apron being perforated, or otherwise rendered pervious, so that the external air, rushing through the apron to fill the vacuum within the box, forces the material close to the apron and confines it there, in combination with the manner herein described, of throwing off or releasing the material from the apron, by suddenly closing the valve in the pipe communicating between the vacuum box and the apparatus for producing the vacuum, and at the same time opening the valve in the said pipe to admit air into the box; or by any means substantially the same.

Second, the flap operating in the maneer and for the purposes substantially as specified.

To G. H. Corliss, of Providence, R. I., for improvement in Governors.

I claim the method, substantially as specified, of steadying the movement of governors or regulators of motion, by apparatus described, or the equivalent thereof.

To Sommers Crowell, of Reading, Pa., for improvements in Railings.

I claim making the dovetailed tenons, whether to the paling, or top and bottom rails, wedge shaped in the length of the railing, the taper at the opposite ends being reverse, and making the grooves in the rails or palings in the same manner, that the palings cannot slide in either direction, binding the whole firmly together, substantially in the manner described.

To Albert Eames, of Springfield, Mass., for improvement in machines for facing and polishing stone and other substances.

I claim the method, substantially as described, of grinding, facing, or polishing the surface of stones and other substances, by means of a grinder, rubber, or polisher, connected and combined with a spindle, from which it derives a rotary motion, by means of universal and sliding joints, substantially as described, that the said grinder, rubber, or polisher, may be carried over any and all parts of the surface to be worked, whilst its surface is self-adapting, as described.

To Wm. Gardner, of New York, N. Y., for improvement in Governors.

I claim the employment of a loose wheel or pulley propelled by the prime mover, and driving its shaft, through the action of a separate elastic force, weight, or pressure, such as procured by the spring in combination with the several racks and pinions, or their equivalents, as described, for operating the adjusting or regulating slides, substantially in the manner specified and for the purposes set forth.

To C. H. Guard, of Brownville, N. Y., for improvement in Carriage Springs.

I claim connecting the axles of wheeled vehicles, by means of curved spring perches, which are combined with the supporting springs of the vehicle, that have a great degree of curvature than themselves, substantially in the manner and for the purpose set forth.

To John O'Neil, of Xenia, Ohio, for improvement in Washing Machines.

I claim the triple and concentrated action of pressure blocks upon the clothes; being constructed and operated, substantially in the manner described.

To Hugh and James Sangster, of Buffalo, N. Y., for improvement in Lanterns.

We claim the mode of attaching the lamp to the lantern, by means of the springs and flanges, substantially as set forth.

To T. J. Sloan, of New York, N. Y., for improvement in method of finishing the heads of screws.

I claim the method described, of finishing the heads in the manufacture of wood screws, partly shaving the head with a cutter before nicking, and after nicking subjecting it to a second shaving operation, to complete the shaving by means of a cutter, whose edges form with each other a more acute angle than the edges of the cutter first employed, as specified.

To Wm. Van Anden, of Poughkeepsie, N. Y., for improvement in Centrifugal Sugar Drainers.

I claim the contrivance for discharging, and at the same time cleansing the strainer whilst in motion, by means of an elevator rising in a spiral groove, substantially as described, or by an elevator rising in vertical or inclined grooves, which is essentially the same.

To N. T. Allen, of Ludlowville, N. Y., for improvement in Grain Harvesters.

I claim gearing the operating parts of the machine from both the wheels, in combination with the arrangement by which portions may be driven by either so as to equalize the driving power upon each, and thus to allow the machine to be much more easily guided and controlled.

DESIGNS.

To S. W. Gibbs, of Albany, N. Y., (assignor to Jagger, Treadwell & Perry), for Design for Stoves.

To W. G. Hallman, of Philadelphia, Pa., for design for Stoves.

To A. Cox, Elias Johnson & D. B. Cox, of Troy, N. Y., for two designs for Stoves.

To J. F. Rathbone, of Albany. N. Y., for design for Stoves.

To David Stuart & Jacob Beesley, of Philadelphia, Pa., (assignor to W. P. Cresson, for design for stoves.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

[Continued from page 310.]

VENTILATION OF GAS LIGHTS.—A few practical remarks upon the ventilation of gas lights may not only be appropriate but acceptable to the reader; its importance cannot be doubted, and yet the subject has commanded but little attention. Much care and attention is paid to the well-lighting of apartments, and far too little is directed to their perfect ventilation. In practice it is well known to be much easier to warm and light apartments, than to properly ventilate them, although the latter may be considered offull as much importance.

Wherever or however light is produced, heat is always evolved. Whether light is obtained from candles, lamps, camphene, gas, or any other organic substance, the elements which supply light are identical in character, although they may differ in their proportional relations to each other. Hydrogen and carbon are the light giving materials, and if a substance is deficient in these two elements, it cannot be used for illuminating purposes; and every substance is resolved into a gaseous state before light and heat are evolved; we have a beautiful illustration before us every evening of the principles of the decomposition of material, its new combinations, and the evolution of carburetted hydrogen gas, in the candle and the lamp, and wherever and however light and heat are produced, whether it be from the pine knot of the backwoodsman or the more unique carcel lamp of the citizen, the same effect is produced. Every candle, every lamp is an illuminating gas apparatus on a small scale; the oil or material to be decomposed, ascends the wick by a capillary attraction through channels formed by fibres of the cotton lying beside each other, and in these channels it becomes heated by the flame to a high temperature and generally is decomposed into an aeriform fluid, which fluid is an illuminating gas. During the combustion, whether the process be effected by oil, gas, or other material, the elements hydrogen and carbon combine chemically with oxygen, supplied to them from the surrounding air; the hydrogen and oxygen produce aqueous vapors (pure water) and the carbon and oxygen produce carbonic acid. In combustion as well as respiration, the effect produced is the same, and the air being deprived of its oxygen, nitrogen is set free, which is as injurious by its negative, as is carbonic acid gas by its positive properties.

The quantities of heat, water, carbonic acid, and nitrogen, resulting from the combustion of any of the materials enumerated, as compared with one another, correspond so closely with the relative quantities of light from each, that the estimate is sufficiently near for practical purposes. Gas yields a brilliant, steady, uniform light; that from candles and lamps is variable. The quantity of light from gas can be increased or diminished as quickly as the wish for it can be expressed. If properly arranged, gas lights illuminate objects in a room from a convenient and agreeable elevation; candles and (portable) lamps are generally placed too near, and in too direct a line with the eye. For these and many other reasons, it is well known that many other persons who use gas accustom themselves to a stronger light than they had been satisfied with from candles or lamps; hence the difficulty in closed apartments of preserving a pure atmosphere and an agreeable temperature. There is no mystery about the matter; each full sized gas-burner yields light and heat equal to that of twelve mould candles of six to the pound. Suppose twelve of such candles to be burning at the same time, and as close together as they could be placed; is it not likely the effects would be soon perceptible? In large and lofty rooms, the heated products ascend towards the ceiling and there remain for a considerable time without materially affecting the lower stratum of air. It is otherwise however in small and low rooms, when the effects of the vitiated air are very rapidly and perceptibly felt.

The identity of the two processes, respiration and combustion, so far as their effects are concerned, cannot escape notice. In both instances air is deprived of oxygen, and heat, water, and carbonic acid are emitted; in the former case, the air which enters the lungs, is retained there for a short period in the act of breathing, and then expelled, materially changed in its character and properties. A portion of the oxygen entirely disappears, combining with vapor of carbon in the air cells, thus forming an equal volume of carbonic gas; the nitrogen is believed to be entirely passive, and to remain unchanged; but when deprived of oxygen it will not sustain life. In the latter case the material to be consumed unites with the oxygen of the air, which is the great supporter of all combustion, and new combinations are formed; the hydrogen unites with the oxygen forming aqueous vapor, and the carbon with the oxygen forming carbonic acid, the same as in respiration. J.B.B.

(To be Continued.)

Scarlet Fever.

The Baltimore Sun says that a number of responsible gentlemen have called upon the editor, confirming the truth of perfectly curing scarlet fever by rubbing the patient three times a day with fat bacon.

To Quell Fire.

Muddy water, and dirt also, is better than clean water to put out fire.

© 1851 SCIENTIFIC AMERICAN, INC.

TO CORRESPONDENTS.

G. S., of Ind.—John Roach, optician, No. 79 Nassau st., manufactures good daguerreotype apparatus, also James Green, 422 Broadway.

S. D. M., of Pa.—The Wilson Sewing Machine would probably answer your purpose better than any other, if you wish it for family sewing or for a small tailoring establishment. Lerow & Blodgett construct a good machine, but theirs is better adapted for large establishments.

P. R. & Co., of O.—For the same device as yours, see engraving of David Anthony's patent Horse Power, on page 393, Vol. 3, Sci. Am. Mr. Anthony's claim covers all the parts found in your machine; see page 12, same Vol.

J. R. L., of Fla.—You are in an error as regards the first principles of ballooning, it is apparent from your communication. Had we time we could quote from those who had lived ages before you were born, who had precisely the ideas you advance, but, like yourself, they were never quite able to demonstrate the thing by experiment.

L. B. G., of Pa.—If such a claim as you mention would answer your purpose, we think a patent might probably be obtained for you. Send in your model and let us see that.

H. G. H., of N. C.—Your name we have entered upon our subscription book, and have sent the back numbers as you requested. Your subscription will not expire again until the end of Vol. 8. The information you solicit concerning Kirkpatrick's Threshing Machine we cannot give.

W. H., of Ind.—Your letter, with funds, came duly to hand.

G. W. C., of Ind.—Scott's Engineers' and Mechanics' Assistant is the work you need: price $24, 2 Vols. You can order it through our office if you desire it.

W. P., of N. Y.—You are not quite correct, for the rollers and the water are different—the logs are partly submerged—but the analogy is nearly correct.

B., of Boston.—Yours will be attended to.

E. M. C., of R. I.—"Momentum" and "quantity" of "motion" are synonomous—it is the product of the mass by the velocity. In estimating the momentum of two moving bodies, we multiply the virtual velocity of each into its weight. If the large ball has a velocity of 8 feet per second, and the small one 6 times that, it comes to about the same thing. The other part to which you refer, was noticed the day before your letter was received, and will be set right.

L. T., of N. Y.—Malleable iron is manufactured at Worcester, Mass., by Macfarlane & Co., but yours is quite a new process, and we believe a good and patentable one.

S. C., of Phila.—If an assignment of a patent is not recorded in the Patent Office three months after date, it does not affect the right of the assignee, it does not go back to the patentee. The neglect of recording only prevents the assignee from suing for infringement until it is recorded. You must sue for your notes.

J. W. O., of N. Y.—We received yours on the "Sci. Men.," but waited for the completion of the record from you before commencing to publish. Will you send the second part soon?

C. S. J., of Cin.—If the application for the patent was not made for two years after the said machine was exhibited, it might be considered an abandonment of the invention, but this could only be decided at a court of law. We believe the patentees would be successful against you, and would advise you to be cautious in the matter.

S. H. N., of Phila.—The hydraulic machine you refer to, was nothing more nor less than a rotary water engine, like Hale's. We have seen Hale's operate by steam, and also by a Croton water pipe. The power of the machine is according to the quantity of water and height of the fall.

G. W. P., of Williamsburg.—You are perfectly right; the "water pendulum," as it has been termed, is familiar to astronomers.

J. B., of N. J.—The government has published no work on explosions since 1848. The best way to collect statistics on the subject, is to peruse files of some daily papers.

B. H., of N. Y.—A moving horizontal cutter and pressure rollers, is not patentable, neither is it an infringement; it is old and is not to be compared with the revolving cylinder.

T. H. S., of M. D.—The owners of property in Broadway object to a railroad in toto, on account of private carriages, not omnibuses. It would do no good to publish your letter.

H. H. H., of N. Y.—If you will peruse the second volume of the Scientific American, you will find a complete series of articles on various kinds of painting, among which is a chapter on water colors well worth your attention.

S. T. J., of Mass.—The engravings for your invention will cost $10, and will be of ten times that benefit to you.

R. K., of N. Y.—We have no doubt but you have lost a valuable patent, all because you were too slow about applying for it. Your friends gave you bad advice.

S. R. T., of Mass.—We cannot publish any more about the pendulum experiment at present—enough said.

A. J. H., of Pa.—The water-wheel about which you speak is exactly like some rotary engines: it is not, by any means, so good as any one we have presented in the articles on Hydraulics.

T. J., of Ohio.—You need not be afraid of the atmosphere getting on fire—the thing is impossible. It makes no matter what people may say about gas light, carbon is the main constituent.

J. C. S., of N. Y.—Yours on the raft has been received and will be published next week. It will be very difficult to base a claim on the form of the hull, but if it is new and useful it is patentable: the shape itself is patentable, also the mode of producing the proper form.

W. Mt. S., of N. Y.—There is Parnells's Applied Chemistry, which is valuable on coal, oil, and other gases; the price is $15. Johnson on American Coals is a U.S. Report, and is a good one—not sold. Knapp's Chemistry is $4 per volume, and is good on caloric and the gases. The best work on caloric—the use of fuel—is a French work, the name of which we forget; if you could get the evidence adduced before Chancellor Walworth, on the Wheeling Bridge Case, you would get much of the information you desire.

J. S. M., of O.—Our correspondence is so large that it is difficult to answer letters. The flax movement description was from the London Mechanic's Magazine. We have got a full description, but it would require us to write you a number of pages to give you the proper idea.

J. A. S., of St. Louis.—Your tale is well told and interesting, but not of universal interest enough to bear publishing in the Sci. Am.

W. H. C., of Mass.—We are obliged to you for directing attention to the error; it should have been three times instead of four, as it acquires the velocity of 32 feet per second, which, if added to the 16, makes 48 feet. It will be corrected.

Money received on account of Patent Office business since June 10:

E. S. C., of Mass., $15; R. W. P., of Mass., $25; G. A. W., of Pa., $30; G. H. K., of Ill., $3,50; R. M. F., of N. Y., $40; N. S., of N. Y., $20; A. R., of Vt., $100; E. G. B., of Me., $10; T. H. D., of N. H., $20; E. B., of N. Y., $25; G. S., of O., $10; C. S. G., of Vt., $30.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since June 10:

R. W. P., of Mass.; E. S. C., of Mass.; G. H. R., of Ill; R. M. F., of N. Y.; G. S., of O.; C. S. G., of Vt.

Post Office Stamps.

In consequence of the change of rates on the first of next month, we would respectfully notify the public that henceforth, until further notice, Post Office Stamps will not be received at this office in payment for subscriptions to the Scientific American.

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2, and 3—none.

Of Volume 4, about 20 Nos., price 50 cts.

Of Volume 5, all, price, in sheets, $2; bound, $2,75.

Of Volume 6, all back Nos., at subscription price.

ADVERTISEMENTS.

Terms of Advertising:

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them at any price.

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents. In the item of charges alone, parties having business to transact abroad, will find it for their interest to consult with us, in preference to any other concern.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., having had many applications for castings from their lathe patterns, with beds planed and screw and gearing cut, have now made arrangements to accommodate that class of customers; this arrangement will enable small shops, with a little more than half of the amount of ready cash, to get them a new lathe. Cuts of these lathes and other tools can be had by addressing as above (post-paid). N. B. Machinists' tools constantly on hand. 33tf

MECHANICS' FAIR.—The Middlesex Mechanic's Association will open their first exhibition for the encouragement of the mechanic arts and manufactures in the city of Lowell, on Tuesday, Sept. 16, 1851. The Committee of Arrangements for this proposed Fair, respectfully invite and solicit all persons engaged in the various branches of mechanism, manufactures, science, and art, to present specimens of their various products for exhibition and premium. Ladies are cordially invited to present specimens of their ingenuity and taste. Preminms will be awarded as the articles presented may merit. Articles for exhibition should be sent on or before Sept. 10th. For more particular information or copies of the circular, address (post-paid) J. A. Beard, Esq., Supt., Lowell, Mass. By order, OLIVER M. WHIPPLE, Chairman.
M. C. BRYANT, Sec'y. 40 6*

SCHOOL FOR ENGINEERING, 650 Houston st., N. Y.—Mr. VICTOR BEAUMONT, Civil Engineer, graduate from "L'Ecole Centrale des Arts et Manufactures," of Paris, is about opening a new course of lessons in the French and English languages, in all the branches, theoretical and practical, connected with Civil Engineering. For details and references apply at the School. 38 4*

LAW'S PLANER FOR PLANK, BOARDS, &c., is now attracting much attention on account of its effectiveness, the excellence of its work, its simplicity, and consequent economy. Machines are now in operation in Brooklyn, New York City, and at various points South and West. Rights or machines for sale by H. LAW, 23 Park Row. 35 tf

MECHANICS' INSTITUTE FAIR.—The attention of Mechanics, inventors, and artisans is especially called to the Polytechnic Exhibition, which will open at the rooms, cor. Bowery and Division st., on the 15th of May. Those who wish to exhibit models, machinery, &c., of mechanical skill, and those who would like to carry on, permanently, any mechanical occupation that would be in any way curious or attractive to visitors, are requested to call on the Actuary. Steam power will be provided. Well-lighted, warmed, and airy rooms can be had on liberal terms. As this Exhibition is permanent, an excellent opportunity is offered to skillful mechanics to bring themselves into notice. Articles may be sent in immediately and will be taken care of and insured. Z. PRATT, Prest.; T. C. DODD, Actuary. 34tf

LEONARD'S MACHINERY DEPOT, 109 Pearl st. 60 Beaver, N. Y.—The subscriber is constantly receiving, and offers for sale, a great variety of articles connected with the mechanical and manufacturing interest, viz., Machinists' Tools—engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, bolt cutters, slide rests, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing,—wrought iron shafting, brass and iron castings made to order. Cotton and Woolen Machinery furnished from the best makers. Cotton Gins, hand and power, and power presses. Leather Banding of all widths, made in a superior manner, from the best oak tanned leather, Manufacturers' Findings of every description—bobbins, reeds, shuttles, temples, pickers, card clothing, roller cloth, potato and wheat starch, oils, &c. P. A. LEONARD. 33tf.

PATENT CAR AXLE LATHE.—I am now manufacturing and have for sale the above lathes: they will turn and finish six sets per day, weight 5,000 lbs., price $600. I have also for sale my Patent Engine Screw Lathe, for turning and chucking tapers, cutting screws, and all kinds of common job work; weight 1500 lbs., price $225, if the above lathes do not give good satisfaction, the money will be refunded on the return of the lathe, if within six months. J. D. WHITE,
3213* Hartford, Conn.

COTTON MACHINERY FOR SALE.—Viz., 4 Filling Frames, almost new; 1-16 Strand Speeder; 1 Warper; 1 Sapper; 2 Wind-mill Fans; 1 Reel; 1 Yarn Bundling Press; 1 Band Machine, and a large lot of tin cans. Apply to ELI WHITNEY, New Haven, Ct. 37 6*

WOODWORTH'S PATENT PLANING MACHINES: 1851 TO 1856.—Ninety-nine hundredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's machines. Persons holding licenses from the subscriber are protected by him against infringement on their rights. For rights in the unoccupied counties and towns of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 28 7eow*

WOODWORTH'S PLANING MACHINE. For sale, the right to use this justly celebrated labor-saving machine in the following States, viz.: Pennsylvania west of the Allegheny Mountains, Virginia west of the Blue Ridge, Ohio, Indiana, Kentucky, Tennessee, Wisconsin, Iowa, Missouri, Arkansas, Texas, Louisiana, Florida, Alabama, and Mississippi. For particulars apply to the Proprietor, ELISHA BLOOMER, 304 Broadway. 38 10*

GREAT REDUCTION IN PRICE.—The most valuable book of the day, containing domestic and medical recipes, rules with regard to the recovery and preservation of health, an account of the different medical theories of the day, useful tables, &c., entitled "THE GRAEFENBERG MANUAL OF HEALTH." It is complete in one volume of seven parts, and is beautifully printed upon fine paper, in a convenient form of 300 pages. The immense success which has attended the sale of previous editions, has warranted a reduction in the price of this (the 7th) edition, from 50 to 25 cts. per copy. Any number of copies, from one upward, will be forwarded upon the receipt of the money, (post-paid). Address THE GRAEFENBERG COMPANY, 214 Broadway, N Y., or this Office. 3tf

DR. S. B. SMITH'S TORPEDO ELECTRO Magnetic Machines.—These machines differ from all other electro-magnetic machines. The inventor has made an improvement by which the primary and secondary currents are united. The cures performed by this instrument now are, in some instances, almost incredible. For proof of this I refer to my new work lately issued from the press, under the title of "The Medical Application of Electro Magnetism." Mail edition, 25 cents. Postage, 6 cents. The Torpedo Magnetic Machines are put up in neat rosewood cases of a very portable size. Price, $12. To agents they are put at $9. Postmasters, druggists, storekeepers, and all who are willing to be instrumental in relieving the sick, are respectfully invited to act as agents. Address Dr. S B. SMITH 297 1-2 Broadway, N. Y., or MUNN & CO., 128 Fulton st., N. Y. Can be sent by Express to all parts of the Union.
39 4*

MECHANICAL DRAWINGS.—The subscriber, having returned to the city, will resume his business as Mechanical Draughtsman and Agent for the sale of Patents. Residence West Fifteenth st., first house east of Sixth av. J. H. BAILEY. 39 2*

A CARD.—The undersigned beg leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton st. 29 3m*

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
WILLIAM B. LEONARD, Agent,
25tf No. 66 Beaver st., New York City.

MACHINES FOR CUTTING SHINGLES. The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 37tf

WILLIAM W. HUBBELL---Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
QUARTERMAN & SON,
35tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines Dick's Presses, Punches, and Shears; Mortising and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 38tf

BAILEY'S SELF-CENTERING LATHE, for turning Broom and other handles, swelled work, chair spindles, &c.; warranted to turn out twice the work of any other lathe known—doing in a first rate manner 2000 broom handles and 4000 chair spindles per day, and other work in proportion. Orders, post-paid, may be forwarded to L. A. SPALDING, Lockport, N. Y. 21tf

FOREIGN PATENTS.—PATENTS procured in GREAT BRITAIN and her colonies, also France Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application
JOSEPH P. PIRSSON, Civil Engineer,
37tf Office 5 Wall street, New York.

RAILROAD CAR MANUFACTORY.--TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
39tf. THOMAS J. FALES.

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
16tf 28 Platt st., New York.

LATHES FOR BROOM HANDLES, Etc. We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles, and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid) MUNN & CO.,
At this Office.

STEAM ENGINES AND BOILER—Several Steam Engines, now finishing, from five to fourteen horse-power; also one of 15 and one of 25. Having just enlarged my manufactory, I am now prepared to make all sorts, from 2 to 50 horse-power, of the best materials in all their parts. One second-hand engine of 8 horse-power, two cylinders, in good order, for sale, with new boiler, $575. Also Galvanized Chain for chain-pumps. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 32 10*

IRON FOUNDERS MATERIALS—viz., fine ground and Bolted Black Lead, Soapstone, Lehigh, Charcoal, and Sea Coal Facing Dusts. Iron and brass moulders Sand, Fire Clay, Fire Sand, and Kaolin in barrels; also best Scotch Fire Bricks, plain, cupola, and side arch shaped, for sale by G. O. ROBERTSON, Liberty Place, (between 57 and 59 Liberty st., N. Y. 36 6*

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions: Washington Factory, Newark, N. J. 38 13*

© 1851 SCIENTIFIC AMERICAN, INC.

Scientific Museum.

For the Scientific American.

Solar Influence.

"The sun's rays," says Herschel, "are the ultimate source of almost every motion which takes place on the surface of the earth. To the varying influence of this grand magazine of heat and light, our globe, in its revolutions and circumvolutions, is ever exposed; and herein have arisen innumerable agents which have continued through all time to modify the face of nature. These modifying causes may be divided into atmospheric, aqueous, igneous, and organic. The former two classes exert a degrading, the latter an elevating influence. The former, were they not counterbalanced by the latter, would eventually wear down the land to a level with the ocean. Atmospheric forces act mechanically and chemically. The degradation of solid constituents is greatly indebted to the abrasion of aerial currents. Frost, also, exercises a powerful influence in modifying the surface configuration of the earth—crumbling down the flinty cliff and giving rise to the ice berg and avalanche, while the receptive and emissive powers of rocks in respect to radiant caloric, lend a powerful aid to the work of decay, called weathering By heat, moreover, are produced those disturbances in the electric equilibrium of the atmosphere, which produce the phenomena of terrestrial magnetism. Aqueous agents exert a more obvious influence in changing this terrene crust. Their mode of action is mechanical and chemical; and their results are distinguished as meteoric, fluviatile, lacustrine, or oceanic. Water, acting through the atmosphere, or by running streams, first circulates in vapors through the air by the efficacy of heat. Igneous agency may exert itself chemically, as in the productions of new compounds, gaseous admixtures, etc., or mechanically, as when it elevates and fractures the superficial substance of the earth. The elastic power of subterraneous fires, relieved by degradation, breaks forth in points where resistance is feeble; and thus, indirectly, the phenomena of volcanic activity is brought under the general law of solar influence. Organic agency presents itself under two heads—vegetable and animal. From unorganized matter plants are elaborated by the vivifying action of solar rays, and become, in turn, the support of animals and the source of those great deposits of dynamical efficiency—coal strata. Animal accumulations are chiefly discernible in the exuvial of shell-fish and coral zeophytes. The construction of reefs is still owing, in a great measure, to the promiscuous aggregation of marine debris, conveyed by tidal currents."

J. W. O.

To Preserve Vegetable Matters for Exportation, &c.

Take potatoes, pare them, and cut them in slices, and immerse them in boiling water for ten minutes. After this, dry them in an oven at about 100 or 120 degs.; they are then submitted to the powerful pressure of a press, when they should be wrapped in tin foil and kept in air-tight vessels until required for use. Peas, beans, &c., may be treated in the same manner. Any vegetable may be dried in an oven at about 125 deg., then ground in a coffee mill, after which they should be pressed and kept in air-tight tin boxes; pumpkins, &c., may be treated in this manner. By these simple directions our farmers may wisely profit. The vegetables may be put into a cotton cloth bag and immersed in the hot water, and a screw or hydraulic press will answer the purpose for pressing. No family in the country need be without a variety of all kinds of vegetables throughout the entire year.

Charcoal.

Wood contained in a vessel entirely closed and exposed to a heat of 752° Fah., undergoes a real fusion; it runs, agglutinates, and adheres to the vessels. After cooling it is found to have lost all its organic texture, presenting only a black shining mass, resembling bituminous coal which has undergone the first stage of fusion. This experiment furnishes us with a simple explanatien of the formation of mineral combustibles. Red charcoal is produced when the wood is heated in a close vessel at 356° Fahr. This charcoal makes the best sporting powder.

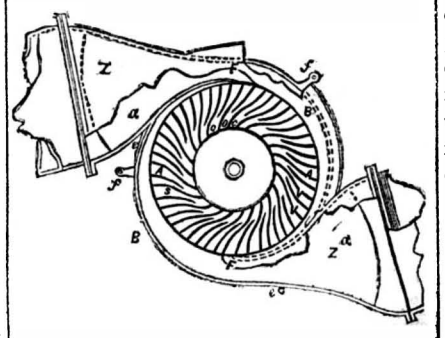
For the Scientific American.

Hydraulics.

(Continued from page 312.)

Thomson's Re-action Wheel.—The accompanying engraving, fig. 54, is a vertical section of a re-action water wheel, for which a patent was enrolled on the 3rd of last July (1851) in the London Patent Office. The buckets are curved. A is the wheel; B is a fixed case with joints. The wheel runs watertight in this case; *v v* are vanes in the wheel, placed between the top and bottom plates forming radiating passages. The water enters at the periphery, and the wheel is what is known here at a "centre discharge." The whole, along with the shaft, may be cast at once. The inner ends of the vanes are turned

Fig. 54.



backwards, as represented, so that when the proper average quantity of water is flowing through the orifices, *o o*, it may be sent backwards from these orifices with nearly the same velocity as that with which they are moving forwards, so that the water, on leaving the vanes, may have little or no velocity of rotation, but only a motion towards the axis of the wheel. Some of the vanes, it will be observed, stop short and do not run to the centre; "this," the patent says, "is to prevent them from occupying too much space, and impeding the flow of water." [A very erroneous idea; why not have less of them? The point of water discharge should be that of the greatest contraction in a re-action wheel]. The water coming to the wheel flows through one or more of the entrance orifices, F F. Z Z are nozzles, terminating at one end in the entrance orifice, and at the other in the supply pipe. After flowing into the case, the water passes along the inside of its circumference, which is of a spiral form, so that the water is made to enter the wheel with a whirling motion. The water has nearly the same motion in direction and velocity as the circumference of the wheel. The patentee is Mr. John Thomson, engineer, Glasgow, Scotland. It will be observed that the spiral to give the water a whirling motion was employed by Parker, in 1829, in the American patent of that date, only this wheel is a centre discharge, the old American patent was an outward discharge. The form of the buckets of this wheel, has also long been known and used in America. In fact the whole of its features are old in America, but it appears to be a good wheel, and without a knowledge of our American ones, it does the inventor a great deal of credit. He employs a regulator, *a a*, but this is also known here and we have seen wheels with one, two, three, and four water trunks. The sluices are connected to the ring, *e*, which can be raisedor lowered by vertical rods attached to it at the ears, *f f*.

[Erratum.—In No. 37, page, 304, at the 38th line from the bottom for *four* times, read *twice* the velocity.]

Cotton Factories South and West.

It has been estimated that there are now in operation in Georgia forty cotton mills, employing near sixty thousand spindles and consuming forty-five thousand bales annually. In this estimate which seems to be below the true mark, no calculation is made of the paper mills, bucket factories, iron establishments, flouring mills, etc. In Tennessee, it has been reported to the Secretary of the Treasury, that there are thirty factories, containing 30,500 spindles and seven hundred looms, consuming fifteen thousand bales per annum. He estimates the capital invested in these establishments at about one million of dollars, and the number of operatives they give employment to at one thousand six hundred. There are in Alabama twelve factories, with a capital of five hundred thousand dollars, containing fifteen thousand five hundred and eighty spindles and about three hundred looms, and consuming about five thousand bales of cotton annually. It is said that machinery for others has been contracted for, sufficient to make the number of spindles twenty thousand and the looms five hundred and fifty. In these three States there are ninety-eight factories and one hundred and forty thousand spindles.

The Screw for Steamers.

In his examination before Lord Jocelyn's steam navigation committee, England, Captain Claxton, whose connection with the construction and sailing performances of the Great Western and Great Britain screw-steamer has gained for him a deservedly-earned reputation, gave evidence in favor of iron steamers and of the screw, which he avers, must, ere many years elapse, be applied universally as the motive power of sea-going vessels. To iron-built vessels Captain Claxton gives a decided preference, the advantages which he ascribes to them being durability, inexpensiveness in repairs, greater capacity, in proportion to tonnage, than wooden vessels, for cargo, healthiness, and in swift sailing. As regards durability, he described the state of the Great Britain, when lying for many months exposed to a series of heavy gales in Dundrum Bay. It was also mentioned that, although the quantity of cockles accumulated on the bottom of the Great Britain since lying in still water at Liverpool was so large as to sell for $27 in the market, no ill effects were apparent when they were scraped off.

Immense Coal Bed.

Mr. J. Dill has communicated to the Family Visitor a brief account of a wonderful deposit of mineral coal at Straitsville, Perry county, Ohio.

"Reports of an immense structure of coal in the vicinity of this place, have long been circulated in Central Ohio. I first heard of it in the winter of 1848-9; it was then reported to be about ninety feet thick. Further examinations ascertained the thickness of the uncovered part, in the face of a deep ravine, at 112 feet. A few days since a gentleman of high standing informed me that an acquaintance of his, with some others, had stripped the upper surface of the bed, and bored through the coal stratum to ascertain its thickness, and found it to be one hundred and thirty-eight feet.

About ten miles south of that mine, I found a vein of carbonate of iron, implanted similar to a slate structure, with an easy cleavage, which is full of well preserved leaves of the coal formation. Some of them on breaking open, exhibit the green of the leaf. The ore, by analysis of Prof. Rodgers, contains 44 per cent. of iron."

Ingenious Invention.

M. Faas, an ingenious German of Philadelphia, has commenced the exhibition of an automaton Tyrolean band of instrumental performers. They are as large as life, and the inventor has succeeded in rendering their movements perfectly natural, while the music performed is admirable. They can be arranged to perform any piece of music in a shorter time than a living band can be drilled into a new overture or march. The figures are nine in number, two being flute players, one clarionette, three bass horns, two trumpets, and one tap drummer. It has cost the inventor ten years of study and labor. We hope when he has them completed, we shall have the pleasure of hearing the dumb whistle once more. We have seen three automatons as large as life discourse sweet music, but ten will beat all predecessors.

Sounding the Gulf Stream.

The United States Sounding steamer Hetzell, Lieut. John Rodgers commanding, has been engaged in efforts to sound the Gulf Stream. At about thirty miles southwest from Key West, bottom was obtained at 730 fathoms; but at another point, the sounding line, at the depth of 3,000 fathoms, was cut off, as was supposed, by a sword fish. The sounding was continued, unsuccessfully, with a line of twine. The Hetzell returned to Key West, on the 8th inst, after a short visit to Havana.

Area of the English Coal Mines.

The coal area of the British islands amounts to 12,000 square miles, being about 1-10th of the entire area of the country; the annual production being 32,000,000 tons.

LITERARY NOTICES.

Iconographic Encyclopedia.—Part 20 of this useful and beautiful work is now published and ready for sale by Mr. Rudolph Garrigue, No. 2 Barclay st., this city: it contains 20 plates of various celebrated architectural structures, both exterior, interior, and plan views; they are beautiful. As we have said before, so we say again, the plates alone of this work render it one of the cheapest and best books ever published.

Books for Railroad Engineers, &c.—We have received from Mr. John Wiley, publisher and bookseller, No. 8 Park Place, this city, "Salt's British Railway and Commercial Information;" "Salt's Statistics and Calculations necessary to Persons connected with Railroads and Canals," and "Bradshaw's Map of the Railways in France, Belgium and Switzerland." These works are valuable and interesting to those engaged on our Railroads and Canals.

Hydropathic Encyclopedia.—We have received the first number of this work, edited by Dr. Trallland published by Messrs. Fowlers & Wells, this city. It is to be issued in 8 numbers of more than 100 pages each: the entire work will only be $2. The object of the work is to bring together in a condensed form, the facts and principles in medicine and its collateral sciences pertaining to the philosophy of life and health. From the number before us, we believe this work to be of a most excellent character.

Dictionary of Mechanics and Engine Work.—No. 31 of this work, by D. Appleton & Co., N. Y., contains articles on the Printing Press, Pumps, Steam and Rotary Punching Machiner, Railroads, &c.

Hunt's Merchant's Magazine, for June.—This Magazine has a world-wide reputation, and justly is it deserved. The articles in this number are excellent in every respect.

J. D. Norris, of the "Yankee Blade," will accept our thanks for his kind remembrance. The Blade is one of the best papers going, and we recommend it to all our friends. Mathews, Stevens & Norris, publishers, Boston, Mass., $2 per annum.

"Graefenberg Manual of Health."—By reference to an advertisement in another column, it will be perceived that the price of this valuable work is reduced from 50 to 25 cents. We have spoken in high terms of it several times, and we presume its sale will be very much augmented. We can send them by mail to any of our subscribers who may be desirous of obtaining a copy.

MECHANICS

INVENTORS
AND
MANUFACTURERS.

The Best Mechanical Paper
IN THE WORLD!
SIXTH VOLUME OF THE
SCIENTIFIC AMERICAN.

The Publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Sixth Volume of this valuable journal, commenced on the 21st of September last. The character of the Scientific American is too well known throughout the country to require a detailed account of the various subjects discussed through its columns.

It enjoys a more extensive and influential circulation than any other journal of its class in America.

It is published weekly, as heretofore, in *Quarto Form*, on fine paper, affording, at the end of the year, an *ILLUSTRATED ENCYCLOPEDIA*, of over FOUR HUNDRED PAGES, with an Index, and from FIVE to SIX HUNDRED *ORIGINAL ENGRAVINGS*, described by letters of reference; besides a vast amount of practical information concerning the progress of SCIENTIFIC and MECHANICAL IMPROVEMENTS, CHEMISTRY, CIVIL ENGINEERING, MANUFACTURING in its various branches, ARCHITECTURE, MASONRY, BOTANY,—in short, it embraces the entire range of the Arts and Sciences.

It also possesses an original feature not found in any other weekly journal in the country, viz., an *Official List of PATENT CLAIMS*, prepared expressly for its columns at the Patent Office,—thus constituting it the "*AMERICAN REPERTORY OF INVENTIONS.*"

Terms—$2 a-year; $1 for six months.

All Letters must be Post Paid and directed to
MUNN & CO.,
Publishers of the Scientific American,
128 Fulton street, New York.

INDUCEMENTS FOR CLUBBING.

Any person who will send us four subscribers for six months, at our regular rates, shall be entitled to one copy for the same length of time; or we will furnish—

10 copies for 6 mos.,	$8	15 copies for 12 mos.,	$22
10 " 12 "	$15	20 " 12 "	$28

Southern and Western Money taken at par for subscriptions.

PREMIUM.

Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

© 1851 SCIENTIFIC AMERICAN, INC.